

CHAPTER NINE

CATEGORY 7, STRATEGIES FOR FUTURE CONSIDERATION

INTRODUCTION

Chapters 3 through 8 describe priority categories, objectives and management strategies required in accordance with Local Law 71. In Chapter 9, a number of additional management and implementation strategies are discussed. These additional items are not required to meet requirements of Local Law 71. However, they are strategies that could be considered in the future as additional ways to improve Jamaica Bay. These strategies could be implemented over time pending the availability of additional funding and other resources. Categories 1 through 6 are discussed in detail in Chapters 3 through 8. Numbering for the strategies discussed below continues from the priority objectives and strategies discussed in Chapters 3 through 8.

CATEGORY 1: WATER QUALITY

Chapter 3, Category 1, Water Quality, describes water quality issues in the context of Jamaica Bay's ecological health and proposes a number of management strategies planned to improve water quality within the Bay. In this chapter, additional proposed management strategies are discussed that could further improve water quality and could be implemented as funding and resources become available.



Potential Management Strategy 1a5: Review and evaluate on-site sewage treatment decentralization technologies for potential application with the Jamaica Bay watershed.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Proceed with a Pilot Program


A number of compact, decentralized wastewater treatment technologies that have been used in rural areas of Europe may be suitable for use in the Jamaica Bay watershed. Using technologies to decentralize the treatment of wastewater and treat sewage at the source would help reduce nitrogen loadings into the sewer system. These types of small scale systems can be designed to provide treatment for 10 to 500 individuals and may also be modified to potentially harness energy from methane production. Similar to the larger WPCPs, they use activated sludge to biologically remove nutrients from the wastewater. According to one manufacturer, typical domestic systems require sludge removal every 3-5 years and systems that receive higher flows may require desludging every 1-2 years. In contrast, lightly loaded systems may go for 10 years or longer before requiring the removal of sludge (EWT Waste Solutions, 2007).



Additional technologies may include solar aquatic systems, anaerobic treatment systems, and composting systems. Composting systems may be the simplest to implement since they require the least amount of water, energy and maintenance and with recent technology advances, can be designed and built for almost any application. These systems use aerobic decomposition to reduce human waste by 97% in volume, with the byproduct of a nutrient rich soil building resource. In summary, composting systems may provide a simple, self-sustaining, low-tech, low-energy, low-maintenance, water conserving and reliable approach to managing human waste.

An analysis of the potential benefits of composting systems was performed to determine the reduction in wastewater flows and in TN discharged. This analysis found that domestic and commercial toilet flows make up approximately 12% of the wastewater flow and contribute as much as 76% of the influent TN to the WPCPs. The large scale installation of composting toilets has the potential to result in water quality improvements and may address some of the impending infrastructure challenges due to anticipated population growth. Implementation could consist of a pilot project to be installed at a public building; and monitoring effectiveness and public acceptance.

It is unclear at this time whether this could be a cost effective treatment for other City agencies or private developments. Therefore, a pilot study will be developed to help to address some of the issues and challenges associated with compact, decentralized wastewater technologies including the performance of new technology, private property issues, maintenance, potential for large scale implementation, and how they function within an urban setting with many existing underground sterilities and structures.

 ***Potential Management Strategy 1c5: Correct compromised sanitary sewers and implement a sanitary sewer connection program focusing enforcement and monitoring of interconnections between sanitary and storm sewers within the Jamaica Bay watershed.***

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Review Existing and Alternative Procedures

The detection of illegal sanitary sewer connections to the storm sewer system is difficult and is typically found through upgrades to the existing sewer system. NYCDEP requires property owners to immediately correct illegal storm/sanitary sewer connections when they are found through existing storm and sanitary construction projects. Alternative procedures used by other municipalities along with existing NYCDEP procedures will be reviewed to make future recommendations.



Potential Management Strategy 1c6: Increase efforts to promote the proper disposal of pet waste, including the provision of pet waste disposal bags and enforcement of sanitation ordinances.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Determine the effectiveness of existing enforcement and outreach programs

The DSNY has implemented a far-reaching citywide campaign to encourage New Yorkers to comply with the law and pick up after their dogs. Through outreach programs, DSNY aims to educate the public on the fact that canine waste is not only an unsightly nuisance, but it can also pose health hazards when it's not cleaned up. DSNY's campaign seeks to educate the public into the "Pooper Scooper" law – officially known as Section 1310 of the New York State Public Health Code – which became law in New York City on August 1, 1978. “With the enactment of this law, the Big Apple became the first major American city requiring dog owners and dog walkers to be responsible for picking up and disposing of their dog's waste. Many other cities across the country – and around the globe – followed suit with similar 'pooper scooper' laws (DSNY, 2007).” Fines for violating the “Pooper Scooper” law have recently been doubled from \$50 per violation to \$100.

While known as a contributor, the level of pet waste contribution to fecal coliform levels in Jamaica Bay is unknown. New York City Community Board Cleanliness Ratings track levels of accumulated trash along sidewalks and streets but do not specify accumulation of pet waste, thus it is difficult to quantify the magnitude of the problem specific to Jamaica Bay. Adapting the Cleanliness Ratings system to include pet waste may be one way to track and monitor enforcement and outreach efforts.

Coordinate ad campaigns/public service announcements to convey connection between water quality and pet waste accumulation

Public outreach currently consists of sidewalk signs posted throughout the City, NYCDPR sign postings, and information distributed by non-profit organizations such as the Green Thumb community gardens program. A Spring 2007 ad campaign was launched by DSNY to encourage people to comply with the intensive enforcement program. The message focuses on “keeping your shoes clean by keeping the sidewalks clean.” With a coordinated or collaborative outreach program, this message could be expanded upon to describe the interconnections between pet waste, fecal coliform levels in Jamaica Bay and overall water quality impacts.



Potential Management Strategy 1d2: Improve dissolved oxygen in Grassy Bay and North Channel by evaluating alternative strategies such as mechanical aeration, fountains, or other engineering solutions.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Utilize coarse bubble diffuser aeration to deliver air to the water column in Grassy Bay

Coarse bubble diffuser aeration utilizes compressors to supply air, and a network of pipes and diffusers located beneath the water surface to distribute the air. At the diffusers, the compressed air is released to the water column in the form of coarse bubbles. These bubbles rise to the water surface, transferring oxygen to the water as they rise. Coarse bubble diffuser aeration is a proven means of transferring oxygen to a water body and is more efficient in moderate to deep waters than surface aeration technologies such as floating aerators.

The advantages of coarse bubble diffusion aeration is that it is a proven aeration system used in many wastewater treatment systems including the Cardiff Bay Project to improve dissolved oxygen within the man-made escarpment. Typically, these systems are relatively easy to operate once installed, with all mechanical parts located on shore for ease of repair and maintenance.

Identifying an appropriate on shore location for these facilities, however, can be a challenge as the potential for noise and air impacts must be taken into consideration. Also, aeration of Grassy Bay, utilizing coarse bubble diffusion given a uniform bottom depth of 28 feet, requires compressors totaling 6,000 horsepower (hp). These compressors would be designed to deliver 57,000 standard cubic feet/min (scfm) of air to the bottom of Grassy Bay. A distribution network would be needed to deliver the air to the water column including a 42-inch diameter ductile iron main to convey the air under pressure to the diffuser network at 28 feet of depth. The air mains would be installed in a trench from the compressor building to the risers, a potential distance of more than 12,000 feet. Installation of the air main within the subaqueous trench and the installation and maintenance of the diffuser networks within Grassy Bay are important considerations for this alternative. Installation and maintenance of the diffuser system within Grassy Bay would also require the use of divers to place, level the diffusers, and perform necessary annual inspections and repairs to the system.

In addition, the use of coarse bubbler diffusers could be potentially disruptive to the aquatic and benthic environments and faces strong opposition from the NPS for its use within its jurisdictional boundaries. Permits or authorizations would be required from NYSDEC, USCOE, NPS, and perhaps others. There may also be potential multi-jurisdictional issues associated with aeration in Grassy Bay; the project may overlap regulatory boundaries, requiring a jointly implemented project to maximize success. Operational priorities and missions may also be different for the various City, state and federal agencies.



Potential Management Strategy 1e1: Continue the ongoing floatables booming, skimming, and netting programs, as appropriate, until other floatable control operations become effective.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Continue existing booming, skimming, and netting program and tracking mechanisms

Floatables booms and nets capture discharged floatables at or downstream of CSO and storm drain outfalls, preventing dispersion to the open waters of Jamaica Bay. Recovery of the captured floatables by skimmer vessels removes the material for proper disposal.

As a result of the June 1992 Combined Sewer Overflow Abatement Program Consent Order, the June 1997 City-Wide CSO Floatables Plan, and the July 2005 City-Wide CSO Floatables Plan, NYCDEP has maintained a booming, skimming, and netting program since 1993 to contain and remove floatable material after discharge from priority CSOs and storm drains throughout New York Harbor. As of December 31, 2006, the City wide system included 21 boom sites and 5 netted sites corresponding to stormwater and combined sewer drainage areas totaling approximately 60,000 acres.

Boom and net locations, inspection, maintenance, service characteristics, and captured floatables volumes are currently tracked through the NYCDEP's Annual Report on Best Management Practices for CSOs. Among other items, this report tracks all of the City's 26 floatables containment facilities, including the five existing booms and net facilities in Jamaica Bay tributaries (*i.e.*, Bergen Basin, Fresh Creek, Hendrix Creek, Paerdegat Basin, and Thurston Basin). Materials contained by the booms and nets are recovered by five. City-owned skimmer vessels, which are off-loaded at NYCDEP facilities. A contractor is engaged to operate and maintain the skimmer vessels as well as maintain the boom and net facilities.

Based on the data, the Pilot Floatables Monitoring Program observations have tended to confirm expectations that the open water at most of the monitoring sites tends to be clear of floatables, and that only a minority of sites have had a significant amount of floatables in near shore areas. Notably, four of the five sites had good or very good ratings during all open water and near shore observations. J3, Canarsie Pier, did have poor ratings for less than 10% of the observations in the near shore (*i.e.*, one poor rating on April 24, 2007 out of thirteen total ratings). For the shoreline ratings, only J8, near the mouth of Spring Creek, has a non-pier, non-bulkhead, "ratable" shoreline, which was rated fair during 100% of the observations.

The booming, skimming, and netting program will continue within Jamaica Bay and its tributaries, with the existing five facilities (*i.e.*, Paerdegat Basin, Fresh Creek, Hendrix Creek, Bergen Basin, and Thurston Basin). Evaluation and reporting programs, including periodic operations performance reviews, CSO Annual BMP Reports, Floatables Monitoring Program, and the multi-agency LPWG participation should continue also.



In addition, the program should be adjusted, as appropriate, to optimize floatables containment operations and to adjust or remove containment facilities should more effective floatables controls come on line in the future. Additional CSO and floatables control mechanisms may also be put in place for other LTCP waterbodies. Boom and net performance reviews should be conducted after implementation of such LTCP controls to determine if the presence of the existing floatables containment facilities will continue to be warranted.

Implement Jamaica Bay Study area-specific cleanliness ratings reviews

In addition to the current programs, Community Board Cleanliness Rating reviews specifically for the Jamaica Bay watershed could be added as a section to the CSO Annual BMP Report to ensure this issue is addressed at least annually. The results, along with Floatables Monitoring Program results for Jamaica Bay monitoring stations, could be presented to the LPWG to help spur discussion about litter and floatables in the study area and local control program improvements.



Potential Management Strategy 1e2: Review and strengthen enforcement activities and sanctions against illegal dumping into Jamaica Bay.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Support DSNY illegal dumping enforcement programs

Illegal dumping is the disposal of liquid, solid, and/or hazardous waste without a permit. Existing local, state, and federal laws prohibit illegal dumping into Jamaica Bay and the Jamaica Bay watershed. Local enforcement is conducted by the DSNY Citywide Illegal Dumping Task Force.

Clear and timely enforcement of all illegal dumping regulations has the potential to improve the water quality of Jamaica Bay, as well as citizen satisfaction with the protection of the Bay's natural resources. Potential obstacles to enhanced legal enforcement sufficient to greatly reduce illegal dumping in the Jamaica Bay watershed include greater law enforcement and surveillance costs, increased coordination among regulating agencies, and costs associated with providing an uncomplicated and legal disposal system for all waste material.

Investigate opportunities to dedicate penalty fines to watershed protection projects (such as the Jamaica Bay Damages Account) and increase public service announcements concerning the environmental dangers of illegal dumping.

Penalties for violation of Environmental Conservation Laws generally include both civil and criminal fines. Additional fines can be assessed for each day that an operation remains in violation, and jail sentences can be imposed. Under a consent order with NYSDEC, an individual or company typically agrees to pay a penalty for its environmental violations, come into compliance with state and federal environmental laws and regulations, and, where necessary, clean up any pollution that it caused. "New York State Governor Eliot Spitzer recently signed legislation that increased revenue to the State's Environmental Protection Fund (EBF) from \$225 million to \$250 million in the 2008-09 fiscal year and to \$300 million in fiscal year 2009-10 and thereafter. Established in 1993, the Environmental Protection Fund provides money for recycling, landfill closure, urban parks, smart growth, open



space, water quality, pollution prevention and a range of other environmental programs administered by the Department of Environmental Conservation and the Office of Parks, Recreation and Historic Preservation” (New York State Governor’s Office, 2007).

Increase advertising of the illegal dumping programs

DSNY has two programs through which the public can collect monetary awards for reporting observations of illegal dumping. Under the first—The Illegal Dumping Award Program — an individual must be willing to sign an affidavit and appear at the Environmental Control Board (ECB) hearing. Under the second — The Illegal Dumping Tip Program — information about the individual’s identity remains confidential. Posting clear and easily accessible information regarding these programs as well as all applicable regulations, fines and penalties for violations may help to deter illegal dumping.



Potential Management Strategy 1f1: Review NYCDEP’s portfolio of industrial pre-treatment permittees within the Jamaica Bay watershed with the goal of enhancing BMPs with respect to their industrial processes.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Map industrial and commercial businesses containing automotive and/or transportation facilities

Proper control of industrial and commercial wastes and materials is essential to prevent the introduction of unacceptable levels of pollutants into storm and combined sewers that discharge to waterbodies. Rules of the City of New York (15 RCNY), Sewer Use Regulations Chapter 19, Section 3 (§19-03), Materials and Substances Excluded from Public Sewers prohibit the discharge of certain chemicals to the sewer system. NYCDEP has existing pollution prevention programs targeted at industrial and commercial (*e.g.*, auto repair shops) businesses that provide outreach and technical and regulatory assistance to raise awareness and help the business community address and avoid the discharge of pollutants such as heavy metals, pathogens, oil and grease, suspended solids, nutrients, floatable materials, and chemicals. To determine additional effectiveness, there may be an opportunity to increase the effectiveness of existing pollution prevention programs by identifying additional BMPs that could be utilized by the dischargers to reduce the amount of wastewater pollutants. In order to identify additional BMPs, automotive and/or transportation facilities would need to be mapped to determine the appropriate types of BMPs, since BMPs are site specific and the potential benefits of implementing additional BMPs would need to be evaluated.



Potential Management Strategy 1f2: Perform risk identification of potential sources of contamination, including airports and other industrial operations, as well as known underground storage tanks, oil storage facilities, former landfills, and Superfund sites.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Review performance and enforcement data within a quarter mile of the Bay and its tributaries

Jamaica Bay was identified by the USEPA and NYCDEP as an impaired waterbody. There are various environmental and human health concerns associated with current conditions within the Jamaica Bay watershed. Industrial and commercial operations and land uses pose significant actual and potential threats to water quality in Jamaica Bay and its tributaries.

In addition to NYSDEC-required registration, the New York City Fire Department (FDNY) also requires registration for those activities that have the potential to cause disruptive environmental spills and flammability issues. To help identify sources and types of industries that pose the highest risk for impairment, a qualitative identification of risk for actual and potential sources of contamination to Jamaica Bay and its tributaries would need to be performed.

Increases in monitoring and enforcement efforts could be developed pursuant to the existing authority in the City's industrial pretreatment program. Spills anywhere in the watershed are problematic; however, those occurring within a quarter mile of the Bay, pose the greatest threat as there are limited opportunities for quick remediation or attenuation prior to reaching Jamaica Bay. The first step toward monitoring and enforcement improvements would require a review of existing performance and enforcement data.



Potential Management Strategy 1f3: Examine the list of brownfields within the Jamaica Bay watershed/sewershed and evaluate on a case-by-case basis how to improve their ecological functioning.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Coordinate with and facilitate existing brownfields programs

Potential benefits of brownfield remediation include reduction of contaminants leaching into the Bay and opportunities to implement sound land use and development strategies designed to restore the Bay. A coordinated brownfields program could help achieve a number of restoration ecology objectives and minimize post-cleanup costs and costly maintenance of caps, pump, and treatment systems.

City and State Brownfield Remediation Programs currently exist. In addition, the OEC is planning to create additional programs for sites that fall outside of state program parameters. Implementation

would involve coordination with OEC to pursue funding opportunities such as Brownfield Opportunity Area (BOA) funding as a way to assess and provide for long term remediation of brownfields in the Jamaica Bay Watershed. The BOA program is designed to assist municipalities and community groups with assessment, prioritization and implementation by:

- Identifying and delineating brownfield remediation sites;
- Identifying known or perceived contamination of the site;
- Developing appropriate reuses; and
- Identifying appropriate remediation technology and actions for priority sites.



Potential Management Strategy 1g1: Identify the nature and extent of contaminated sediments in Jamaica Bay.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Identify existing data gaps and validate currently used or proposed models

The Hudson River Foundation in consultation with HydroQual, Inc. expects to release a mathematical modeling report for contaminated sediments by early 2008. The model will evaluate point and non-point source loading inputs, estuarine hydrodynamics and sediment transport, contaminant fate and transport, bioaccumulation, and toxicity for the Contaminant Assessment and Reduction Project (CARP). Review of the mathematical model would support further sediment evaluation of Jamaica Bay. Other sediment toxicity and bathymetric references were identified, but not reviewed for the preliminary conceptual site model including:

- Hudson River Foundation. 2004. Health of the Harbor: The First Comprehensive Look at the State of the NY/NJ Harbor Estuary 2004.
- Harbor Estuary Program (HEP). March 1, 1996. Comprehensive Conservation and Management Plan.
- Jamaica Bay Institute research.
- Numerous studies from local universities including Columbia, City University of New York (CUNY) at Staten Island, and State University of New York (SUNY) at Stony Brook.
- NOAA data for 1934, 1950, and 1995 related to sedimentation rates in Jamaica Bay.

Review of these references may provide additional information for the sediment toxicity component of the conceptual site model.

Develop a plan for collection and analysis of additional sediment data, including current bathymetry

NYSDEC technical guidance (TOGS 5.1.9, NYSDEC 2004) suggests the collection of approximately 200 to 300 sample locations would be required to evaluate an area of the approximate size of Jamaica Bay. Several investigations of Jamaica Bay sediment have been completed. Nonetheless, the data set for Jamaica Bay appears limited. For example, the Regional Environmental Monitoring and Assessment Program (REMAP) investigation collected and analyzed 28 surface samples (0 to 2 cm)

from Jamaica Bay. To further refine the extent of contamination and limit disturbance to benthic communities, the evaluation of sediment would require more extensive sampling and analysis than that of current conditions.



Potential Management Strategy 1g2: Create a plan to mitigate toxic sediment mounds in Jamaica Bay, either through on-site capping or sediment removal.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Obtain physical data of sediment to support sediment management options

Assessment of sediment toxicity is best completed by a weight of evidence (WOE) approach; this approach, accepted by regulatory agencies, represents current risk assessment practice so that decision-making reflects potential impacts in a manner not necessarily determined by a review of one set of information and data. The objective of the WOE approach is to integrate results from various lines of evidence collected in the ecological risk assessment to identify areas requiring further evaluation; endpoints are selected and weighted based on the quality of the underlying information. This approach may eliminate from consideration some locations, while focusing attention on others.

Dredging and recontouring schedules for Paerdegat Basin, Fresh Creek, Bergen Basin and Thurston Basin have been developed and submitted to NYSDEC for approval in the Paerdegat Basin LTCP report and the Jamaica Bay and Tributary Waterbody/Watershed plan report. These efforts will reduce the level of toxic sediments within these tributaries.

In addition, the HEP workgroup on toxics has developed the CARP to quantify the sources of contamination to harbor waters. The goal of this program is to reduce the amount of contaminants entering local waterways. The group is also reviewing and revising the list of Chemicals of Concern (COC) and developing mathematical models to predict those that may be problematic (HEP, 2005). The continued work by this group and others is critical in developing appropriate and successful remediation measures. In addition, this information can be used to continue monitoring the rate of natural attenuation following implementation of source controls.

Evaluate sediment management options relative to technological capabilities and management objectives for Jamaica Bay

The TOGS 5.1.9 guidance defines three sediment quality threshold classes of sediment materials based on the magnitude of certain organic and inorganic constituents. Options for managing dredged sediments are based on the threshold class that applies. The threshold classes as defined in TOGS 5.1.9 are as follows:

- *Class A*: No appreciable contamination (no toxicity to aquatic life) and “dredging and in-water riparian placement, at approved locations, can generally proceed.”

- *Class B*: Moderate contamination (chronic toxicity to aquatic life) where dredging and riparian placement may occur with restrictions.
- *Class C*: High contamination (acute toxicity to aquatic life) where “dredging and disposal requirements may be stringent.”

The TOGS 5.1.9 guidance suggests that evaluation of dredge material classified as Class B or C include evaluation of the underlying sediment that would be exposed as a future sediment surface. In situations where the concentrations of target constituents in the sediment increases below the proposed dredge sediment, the TOGS 5.1.9 guidance presents three options for consideration:

- dredge shallower
- dredge deeper and cap
- dredge deeper until cleaner.

There are several factors to be considered in the development of sediment management goals. The Sediment Management Work Group identifies the most important questions to be answered in the decision process. Sediment management decisions should incorporate the current level of technical capabilities and experience to define realistic project goals. Performance based dredging goals allow these factors to be considered.

CATEGORY 2: ECOLOGICAL RESTORATION

Chapter 4, Category 2, Restoration Ecology, proposes a number of strategies to evaluate and prioritize land acquisition and ecological restoration projects throughout the Jamaica Bay watershed. Additional land acquisition and ecological restoration projects that could be implemented as funding and resources become available are discussed in this chapter.



Potential Management Strategy 2b2: Identify and compile all known freshwater habitat restoration plans. Where applicable, implement federal, state and local agency projects along the periphery of Jamaica Bay and within the watershed.

STRATEGY DESCRIPTION

As described in the Jamaica Bay Conservation and Restoration Project Inventory, under Management Strategy 2b1 of the JBWPP, this strategy recommends a collaborative effort among multiple agencies and environmental groups to identify potential restoration opportunities within the Jamaica Bay watershed. This inventory will include the identification of potential freshwater-based restoration opportunities. In addition, where applicable, many of the existing restoration projects occurring within the watershed consider the installation of freshwater wetland habitat. Category 3, Stormwater Management through Sound Land Use of the *Jamaica Bay Watershed Protection Plan* also identifies a number of on-site and off-site BMPs, such as constructed wetlands, bioinfiltration basins and vegetated swales that result in the creation of modified freshwater-based wetland habitats.



Freshwater wetlands provide a unique habitat for a variety of plants and also for a suite of animal species that may not utilize tidal wetlands. These types of wetlands can provide important flood control functions, improve water quality by capturing sediments and sequestering and processing nutrients and contaminants, and provide habitats for myriad plant and animal species.

A review of the National Wetland Inventory (NWI) mapping prepared by the USFWS for the Jamaica Bay watershed finds that there are only about 434 acres of freshwater habitats remaining in the watershed, making freshwater-based habitats extremely rare. Approximately half of this area is open water (lake or pond) and the remaining areas are mapped as emergent or forested wetland. Much of the emergent wetland is located on JFK Airport property and is managed for safety reasons to eliminate use by wildlife. The remnants of the freshwater systems that once traversed the watershed are represented by the dead-end basins and creeks such as Paerdegat Basin, Spring Creek, Fresh Creek and Hawtree Basin. The stream corridors have been culverted and the riparian wetlands and uplands were filled and cleared as the watershed was developed. In summary, there is very little freshwater-based habitat remaining in the watershed, and the few areas that do remain tend to be isolated and disconnected.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Restore Freshwater Wetlands

During an initial review of projects within the Jamaica Bay watershed, the following freshwater habitat creation projects have been completed:

- Big John Wildlife Pond and Return a Gift Pond on Floyd Bennett Field
- Strack Pond - Forest Park Twin Ballfields
- West and East Ponds (brackish)
- Idlewild Park
- Belt Parkway stormwater wetlands (in design)

Additional freshwater wetland projects currently proposed or with potential for restoration opportunities within the Jamaica Bay watershed include the following:

- South Garden Pond Freshwater (Jamaica Bay Wildlife Refuge – west side of Cross Bay Blvd.)
- 20th Road (near Big Egg Marsh)
- Springfield Pond
- Conselyea's Creek, Brookville Park
- Baisley's Pond
- Interborough Parkway stormwater capture in created wetlands near Ridgewood Reservoir.

Due to the many functions provided by freshwater wetlands and the scarcity of this habitat type throughout the watershed, existing restorations where applicable are recommended that freshwater habitat creation and restoration occur in the watershed. The construction of freshwater habitats would enhance plant and animal species diversity, could potentially benefit a number of endangered and threatened species, and would also be important to migratory birds, which are extremely reliant on Jamaica Bay for resting and feeding during migration through the urban New York metro corridor. The creation of freshwater wetland should be coordinated with other restoration efforts in order to increase connectivity and wildlife corridors.

CATEGORY 3: STORMWATER MANAGEMENT THROUGH SOUND LAND USE

Chapter 5, Category 3, Stormwater Management Through Sound Land Use, describes stormwater BMPs to be implemented in conjunction with the JBWPP and includes a discussion of how human uses of land within the Jamaica Bay watershed affect ecological processes. The JBWPP does not include any additional stormwater management strategies for future consideration at this time.

CATEGORY 4: PUBLIC EDUCATION AND OUTREACH

Chapter 6, Category 4, Public Education and Outreach, proposes a number of initiatives to address public education and outreach. In this chapter, other implementation strategies are suggested for future consideration. These strategies could be implemented over time pending the availability of additional funding and other resources. As discussed in Plan Implementation and Coordination, Chapter 8, the NYCSWCD can coordinate and foster many of these initiatives.



Potential Management Strategy 4a1: Raise awareness among young people to promote local environmental stewardship early during a child's development.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Develop New K-12 Curricula for Jamaica Bay

Based on the development of the Jamaica Bay Educators' Resource Guide (see Chapter 6 for a description of this implementation strategy), the Jamaica Bay Watershed Education Coordinating Committee determined that numerous environmental education resources related to Jamaica Bay already exist and have proven successful among educators. However, in the future, a more comprehensive, long-term strategy will be needed to raise awareness and stewardship among young people. Such a strategy may involve the design, development, implementation and subsequent evaluation of new or enhanced inter-disciplinary, inquiry-based environmental education curricula for K-12 grade students. The curricula developed would include opportunities to learn specifically about Jamaica Bay's ecological systems, introduce environmental careers, and ultimately facilitate environmental stewardship. New curricula developed would need to be aligned with the NYCDOE Science Scope and Sequence and other performance standards to ensure usefulness and support from educators and administrators.

Modifying curricula to incorporate watershed ecology topics will ensure that young people are exposed to local environmental issues. In addition, there are great opportunities to incorporate inquiry-based learning techniques, such as environmental research science projects and data collection programs that focus on the Jamaica Bay watershed. Finally, facilitating interaction between students and the large community of professional scientists, planners, engineers, and resource managers in the watershed can expose students to a multitude of careers and professional education opportunities to which the students may otherwise be unaware.



The Jamaica Bay Watershed Education Steering Committee (recommended in Chapter 6, Plan Implementation and Coordination) will need to continue to engage NYCDOE in a review of the proposed program and discussions of potential projects. Appropriate partnerships, required resources and roles would be identified for the implementation of new curricula and different funding opportunities will be explored. Additional steps include the design of a coordinated outreach approach and training program for educators and schools within the watershed to promote new resources for curriculum planning and implementation, and methods for field testing and program evaluation.

Deliver educational messages about Jamaica Bay and its watershed through informal mechanisms and non-traditional media.

Providing a variety of resources for formal and informal educators will allow Jamaica Bay-specific information to be more easily adopted in the classroom, after school program sites, parklands and other community settings in the watershed. Estuary Live, hosted by the HEP on September 29, 2006, is a good example of an interactive program that involved many different environmental education partners and high school students from the watershed in an hour-long live web broadcast from Big Egg Marsh. The nationwide broadcast focused on the importance of coastal wetlands to people and nature, the disappearance of salt marshes in Jamaica Bay, and the roles we can all play in understanding and improving the health of the estuary. Approximately 500 nationwide registrations, including entire schools, were received to watch the live broadcast, and over 200 students emailed questions during the broadcast. Using Estuary Live as a model, different media and various technologies (*e.g.*, web conferencing, web streaming) may provide effective and efficient means for delivering educational messages to broad audiences and supplementing curricula targeted toward specific audiences.

Many benefits can be found in productions such as Estuary Live. The live broadcast provides an opportunity to get students actively engaged in the field and for others nationwide to learn interactively. The ability for students to view, from their classroom, other students' interaction with the natural environment is beneficial given the many challenges that limit educators' ability to schedule field trips that would encourage field and hands-on learning experiences (*e.g.*, lack of staff, lack of funding for transportation, and standardized testing requirements that can limit curricula development). However, this type of production can be costly and labor-intensive. The Estuary Live production required intense planning by two individuals for six months prior to the production (Laura Bartovics, pers. comm.), plus individual preparation time by all participants. Satellite linkages provide professional-quality video but are prohibitively expensive (on the order of tens of thousands of dollars for a production). In addition, to successfully implement alternative instructional tools and techniques that would allow the Jamaica Bay watershed to become a "living classroom" may require teacher training or new equipment within schools.

Global Learning and Observations to Benefit the Environment, or GLOBE, is a K-12 program to improve science education by involving students and their teachers in world-wide research examining long-term global change. GLOBE provides protocols in the areas of atmosphere, water, soil, land cover and phenology which allow students to make scientific measurements and send their data via the Internet to the GLOBE database. The data is then used by various scientists studying global change as well as other teachers and students to compare environmental conditions worldwide. CUNY at Queens College in the Jamaica Bay watershed is the local GLOBE partner for the New



York City area and has trained hundreds of metropolitan area schools to record environmental data and post it online.

Several organizations and agencies are looking into ways to use non-traditional media or alternative technologies to deliver educational messages to widespread audiences including schoolchildren. Potential tools could consist of video conferencing, Web streaming, and Webinar systems and potential funding opportunities include corporate or foundation grants in addition to government partnerships.

Other projects can include:

- Design, develop, implement and evaluate new and enhanced inter-disciplinary, inquiry based environmental education programs for after school programs, on weekends, and during summer vacations for young people to learn about Jamaica Bay's ecological system, introduce environmental careers and facilitate environmental stewardship.
- Create multi-media resources using video or Web technology that feature the Jamaica Bay watershed and ways young people can collect and share data and interact with and learn from the Bay's ecological system.

Provide Educational Opportunities for Teachers and Other Educators

Classroom teachers and informal educators from youth groups, environmental organizations and government agencies will need to learn about Jamaica Bay so that they can develop and implement lessons and activities that match the appropriate learning styles of the young people and adults they work with. This strategy would help educators to become familiar with the topics that can be learned from exploring Jamaica Bay and the diversity of resources available to them. Ongoing coordination and networking will enable educators to continue to learn from one another and form partnerships that support their educational goals.

Currently, the GNRA Jamaica Bay Unit offers teacher workshops for ranger-guided and teacher-led school programs to discover, explore, and measure and compare environmental conditions in different habitats around the estuary. As part of Operation Explore, NPS along with its cooperating agencies provide teachers with full day training sessions to teach teachers about coastal plants, animals and environmental conditions at GNRA and then compare them with upstate forest, aquatic, farm and community environments. NYSDEC offers professional development opportunities for K-12 teachers including Project WET, Project WILD, and Flying WILD which range from 3 to 6 hour training sessions and provide teachers with manuals, curricula and activities to use in the classroom.

Utilize service learning opportunities at elementary and high schools, higher education institutions, and community organizations to create an informed citizenry.

Service learning is a teaching and learning strategy that integrates community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities. This is accomplished by combining service tasks with structured opportunities that link the task to the acquisition of knowledge, skills, and values. For example, if high school students participate in planting trees in the watershed, they are learning about soil erosion, stormwater management and hydrology while providing an important service. The students can analyze trash



collected in the watershed, monitor floatables in the Bay and share observations with elected officials and community members along with recommendations for reducing pollution. Along with suggestions for reducing pollution, they are engaging in service learning. Therefore, the service learning objective is to combine service with learning in intentional ways. In the past several years, service learning has spread rapidly through communities, K-12 institutions, and colleges and universities nationwide. The National Service Learning Clearinghouse (<http://www.servicelearning.org>) includes more information on this nationwide trend. The Council on the Environment of New York City, a member of the Jamaica Bay Watershed Education Coordinating Committee has been involved in service learning through their successful, Training Student Organizers Program.

The purpose of service learning is to build upon these efforts by expanding the range of learning opportunities through active engagement in meaningful hands-on community service projects, where people of all ages gain skill and knowledge while exploring and discovering Jamaica Bay.

Becoming engaged with local environmental issues through hands-on volunteering projects will help students make the connection that the environment is impacted in both positive and negative ways by human activities. Children as young as pre-school age can enjoy being involved. It is also important to encourage the involvement of parents and community leaders. This would allow parents to lead by example and model stewardship concepts.



Potential Management Strategy 4a2: Raise awareness of Jamaica Bay-related issues through creating an informed citizenry.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Promote the economic value of open space, wetlands, “green” development, and low impact development within the watershed.

Environmental regulations enforced by governments to protect environmental resources, are often seen as being “unprofitable” to businesses and property owners. For environmental protection and sustainability to become truly integrated into the City, it is necessary to demonstrate that these can also be economically viable. In fact, environmental protection most often makes economic sense when all the public costs are considered and often no choice between economic growth and environmental protection is necessary. Further, it is well-documented that amenities such as open space can significantly add to property values. For instance, the stormwater BMPs under construction in Staten Island have increased adjacent property values. It is also well documented that neighborhoods with tree-lined streets are more desirable, and thus return higher property values, than neighborhoods without mature street trees. Existing information on the private benefits of land preservation and sustainable development can be used to educate developers and other city agencies that environmental sustainability is not only desirable, but also makes economic sense.

For example, The Trust for Public Lands published a report in 1999 entitled “The Economic Benefits of Parks and Open Spaces” which offered case studies of how land conservation and protection have served as economic investments to help communities attract investment, revitalize cities, boost tourism, etc. The 2007 book “The Economic Benefits of Land Conservation” was based on the



success of the 1999 report and includes analysis by many experts in the field regarding the dividends, including economic ones, of conserving and protecting land. These documents are available from The Trust for Public Lands website (<http://www.tpl.org>) at no charge.

As part of this implementation strategy, informational materials can be developed and publicized to public and private development entities in New York City, with the goal of encouraging land use and development practices to be more environmentally sustainable.

Develop a series of interpretive exhibits at GNRA facilities and beyond.

Currently, the GNRA uses interpretative signage to describe natural features and ecological processes that can be observed at different locations throughout the Jamaica Bay Unit including the Jamaica Bay Wildlife Refuge. NYCDEP recently provided GNRA with information and illustrative materials developed as a result of the *Jamaica Bay Watershed Protection Plan* planning process to date for a temporary display at the Jamaica Bay Wildlife Refuge. In addition, interpretive signage in other locations outside of the GNRA system, developed in conjunction with *Public Use and Enjoyment* strategies, would allow public educational opportunities to be expanded throughout the watershed.

As part of this strategy NYCDEP will review its existing interpretive exhibits to determine any gaps in Jamaica Bay-related information. In addition, the assessment of this strategy will involve a review of other potential locations in addition to GNRA for interpretive exhibits such as city parks, schools and community centers throughout the watershed.

Establish a program of events including a “Bay Day” or “Eco-festival” that increases awareness and enjoyment of Jamaica Bay through celebration and learning.

The Jamaica Bay watershed is endowed with a rich ecological, cultural, and recreational heritage, and can truly be called one of the “gems” of New York City. Public celebrations of these assets will provide environmental education about the watershed to the general public in ways that other programs may not. It will also support a number of *Jamaica Bay Watershed Protection Plan* values: supporting Jamaica Bay watershed restoration and improvement efforts; fostering public outreach; providing opportunities for public education; promoting public use and enjoyment of Jamaica Bay in a safe and ecologically sustainable manner; and building community cohesion related to the ecological sustainability of Jamaica Bay.

In recent years, increased environmental awareness appears to have resulted in an upswing in popularity for festivals involving environmental issues in the suburban New York region. For example, the June 15, 2007 edition of the *Journal News* reported that the Clearwater Festival, a local music/environmental festival celebrating the nearby Hudson River Estuary, has received more volunteers than there are jobs for them to do.

This strategy involves identifying outreach and recreational groups to discuss opportunities to leverage and coordinate current activities that are designed to increase awareness and enjoyment of Jamaica Bay, and the potential for organizing a Jamaica Bay event or festival. Local musicians/bands may be willing to provide entertainment and promote Jamaica Bay.



Create a targeted campaign for public officials and public agency representatives that include briefings, workshops and boat tours about Bay-related issues and opportunities.

Coordination and communication between elected officials, public agency representatives, researchers and stewards of the Bay would enhance ecosystem restoration efforts underway in the watershed by bringing attention to the issues facing the Bay. A combination of briefings, workshops, and boat tours of the Bay would be organized to foster this transfer of knowledge and provide current information on the status of ongoing projects. This strategy is designed to gain consensus and commitment to reverse negative impacts on the Bay. Continual education and awareness of the ecological linkages between human uses and water quality and ecosystem health is especially critical for the decision-makers as the *Jamaica Bay Watershed Protection Plan* is implemented.

This strategy would utilize the *Jamaica Bay Watershed Protection Plan* to formalize issues, current efforts, and necessary future actions with public officials and local, state and federal agencies. A “tool kit” can be developed to cover critical information about the Bay and its watershed. The information included in the kit could serve as the foundation for a “traveling show” that could be easily tailored based on the target audience.

Develop an expanded grease remediation program

Grease is a byproduct of food preparation, and represents a source of pollution to Jamaica Bay, contributing to high levels of eutrophication and low dissolved oxygen. In addition, grease can coagulate in pipes, and restrict flow or cause blockages, causing maintenance problems for individual property owners and the City. One way of preventing grease discharges into our sewer systems is utilizing grease traps. Grease traps are devices that are installed in the waste line leading from sinks and floor drains of restaurants, kitchens, cafeterias, or other establishments where grease can be introduced into the sewer system. The primary purpose of grease traps is to prevent discharge and buildup of grease in the sewer system, thereby reducing the potential for clogging.

In May 2000, NYCDEP initiated the Grease Response Education and Enforcement Program in order to reduce the amount of fat, oil and grease discharges from food service establishments from entering the sewer system. This program approaches the problem with a combination of enforcement actions and public outreach and educational efforts, including foreign language materials which are distributed to restaurants. Educational efforts include trade show appearances, Community Board and other public meetings, direct mailings, informational hand outs, and NYCDEP website postings. Residential grease discharge is also a problem. NYCDEP distributes leaflets and promotional items reminding the public not to pour grease down the drain. There is a growing market for these restaurant waste products since it can be filtered and burned in place of diesel fuel in vehicles that have been converted for such use. For example, in the July 1, 2006 edition of the Washington Post it was reported that one company that sells “conversion kits” to allow diesel cars to burn vegetable oil as fuel has gone from selling about 20 kits a month in 2000 to as many as 100 a week in 2006. There may be an opportunity for an entrepreneur to establish a grease recycling program by collecting, filtering and selling the grease as fuel.



Heighten public awareness through a “Don’t Dump, Drains to Jamaica Bay” message affixed to curb inlets, storm drains, and catch basins.

Many municipalities that exist next to environmentally-sensitive areas, including major cities in the Chesapeake Bay, San Francisco Bay, and Puget Sound watersheds, to name just a few, affix signage to curb inlets, storm drains, and catch basins to remind residents not to dump household or industrial waste directly into the storm drain system. This type of public awareness program has been proven to effectively reduce the amount of liquid and solid wastes that end up in receiving waters. NYCDEP has designed a similar program for New York City and, as a result, NYCDDC has begun the gradual installation of the message - “Dump No Waste, Drains to Waterways” - next to the image of a fish on catch basin curb pieces. The message is installed during catch basin repair and curb reconstruction projects; consequently, the installation of the message on the City’s 130,000 plus catch basins will occur over time per repair and reconstruction schedules. Painting the above message on catch basins would expedite communication of this issue and implant a heightened awareness of their relationship to the Bay and its watershed in the public.

In December 1998, the NYCDEP published a report titled “Evaluation of NYC Municipal Separate Storm Sewer System Stenciling Program 1998.” The report describes and evaluates the stenciling program implemented in 1995 and 1996, in which the phrase “Don’t Dump Here, Drains to Bay” was painted, using stenciling kits, onto the street or curb pavement adjacent to catch basins located in selected areas. Based on sampling data for four of the stenciled drainage areas, the number of complaints regarding dumping incidents rose more rapidly than that of the corresponding non-stenciled drainage area. This is an indication that stenciling has raised public awareness and encouraged the public to report discharge incidents to NYCDEP. Based on limited water quality sampling (nine stations, two of which were stenciled in the fall of 1995), no reductions in pollutants that could be attributed to the stenciling program were detected.

According to the 1998 NYCDEP report, stenciling lasts about two years. The report includes a table that evaluates each option in terms of many factors such as lifespan, maintenance, installation, visibility, and costs of different materials. The report recommends additional evaluation of the glue-down curb markers, cast iron signs, and/or pre-etched catch basins bearing the message “Don’t Dump Here, Drains to Bay” as a potentially longer-term solution.

Past implementation of stenciling has been conducted by volunteers. This program could be coupled with the service learning implementation strategy discussed above.

Continue support for community, environmental advocacy, and volunteer groups to remove litter and other debris from accessible shoreline sites as well as upland areas.

Volunteers can be very effective at helping to remove debris and floatables that get washed onto the shoreline around Jamaica Bay, or keeping upland areas litter-free. Several on-going volunteer programs in New York City address litter-control issues, but there may be opportunities to augment these programs in the Jamaica Bay watershed. In 2007, NYCDEP will be working with the DSNY in an interagency partnership to support volunteer clean-up efforts. Every year, from April to October, under the support of the DSNY, volunteers conduct clean-up projects in their blocks, neighborhoods, and boroughs. Community groups, block associations, merchants associations, and concerned citizens contact the DSNY to reserve cleaning tools, such as brooms, rakes and shovels, which the DSNY makes available in short-term loans. After a clean-up, DSNY promptly collects and removes the



bagged waste. The program can be promoted to similar volunteer groups in the Jamaica Bay watershed, to assist them in taking advantage of the resources that are available under the clean-up program.

In addition, NYCDEP will continue to organize and support multiple beach clean-ups each year and provide the heavy equipment needed to help communities remove large debris from their beaches. Planning of these events could include a review of the New Jersey Department of Environmental Protection's (NJDEP) Adopt-A-Beach Program, which is a biannual beach clean-up effort that has been successful since its inception in 1993. This program involves a service learning component in which volunteers keep a running tally of items of litter collected and forward this information to the Center for Marine Conservation (CMC) in order that it be included in the CMC's national and international marine debris database. Beach clean-up dates are often planned to coincide with national beach clean-up events, such as the observance of International Coastal Clean-Up Day (sponsored by the Ocean Conservancy, a Washington DC based non-profit).

NYCDEP will continue to work with other agencies on citywide litter reduction strategies as part of the Litter Prevention Work Group. Finally, NYCDEP will also support litter prevention public education campaigns by providing speakers, audio-visuals, literature, and promotional items related to floatable reduction, water quality, water conservation, stewardship of Jamaica Bay, and other relevant environmental topics.

Based on the Street Litter Ratings system through which the Mayor's Office of Operations tracks citywide cleanliness, New York is the cleanest it has been in over 30 years. Continued support of litter prevention public education campaigns and cleanliness tracking will help the City maintain such cleanliness and reduce the discharge of floatables.

Promote community gardens and other opportunities for urban plantings.

Community gardens reclaim open space and use it for community needs, including food production and education. They encourage the "greening" of the urban landscape, and increase the environmental sustainability of a neighborhood. The New York City Community Gardens Coalition is an organization dedicated to maintaining a cooperative between communities to enhance the experience by sharing in techniques, planting stock, and fun. The Coalition is also dedicated to converting open space to gardens. There may be opportunities to foster the development of additional community gardens in the watershed by increasing the level of communication between city agencies and existing community garden clubs such as the Community Gardens Coalition, and making additional public resources available to them. The New York City Open Accessible Space Information System Cooperative (OASIS, <http://oasisnyc.net>), a partnership for sharing data and information in the New York City area, contains a wealth of information regarding existing organizations that provide support for community gardens.

Implementation of community garden projects should include a discussion of soil testing for lead and other toxins. Soil contamination has been recognized as a concern in urban areas. Some community gardens, such as the 6/15 Green Community Garden in Brooklyn, conduct soil analysis on an ongoing basis to ensure the health and safety of the public. The Cornell Nutrient Analysis Laboratories (CNAL) in Ithaca, NY, is an organization that provides cost-effective soil testing. The CNAL website (www.css.cornell.edu/soiltest/newindex.asp) includes soil testing information and instructions on how to get soil tested.



Increase the number of volunteers throughout the watershed by promoting volunteer opportunities in a coordinated manner and by providing meaningful volunteering experiences.

Some citizens learn most effectively and become more engaged in watershed protection not through efforts aimed at “teaching” them but through active engagement in the landscape. By using their hands and feet and physically laboring in the areas they care for, they gain knowledge that they would never absorb from traditional learning methods. They also gain visceral connections with the landscape and solidify their commitment to it in ways which can modify their everyday practices toward greater resource conservation and protection. This strategy aims to expand upon existing programs and introduce new venues and opportunities for volunteering, including volunteer public landscape restoration and development, participation in service learning opportunities (see “Utilize service learning opportunities at elementary and high schools, higher education institutions, and community organizations to create an informed citizenry” above), and volunteering service-sector expertise toward *Jamaica Bay Watershed Protection Plan* efforts.

There are many ecological restoration projects currently underway within New York City, including the Jamaica Bay watershed. Many of the sponsors of these often labor-intensive projects reach out for volunteers. For example, the NYCDPR Natural Resources Group (NRG) regularly advertises for seasonal interns to work on a variety of ecological restoration projects. Many of these projects include education and research components in addition to physical labor.

The following programs currently provide volunteer services to advance the environmental restoration, protection, or enhancement of the Jamaica Bay watershed:

- *American Littoral Society, Jamaica Bay Guardian*: Sponsors Operation Jamaica Bay Clean Sweep (removal of derelict boats from shoreline) and beach clean-ups; conducts wildlife censuses for the National Park Service.
- *Bay Improvement Group*: Maintains three community gardens; organizes clean-ups and sweep-ups of the waterfront and adjacent communities.
- *Friends of Gateway, Gateway Greenhouse Education Center at Floyd Bennett Field*: Oversees a volunteer program to cultivate trees, shrubs, and plants for New York City’s public spaces; conducts beach clean-ups.
- *Jamaica Bay Watershed Alliance*: Hosts community clean-ups, tree planting programs to prevent runoff, and stewardship activities for school children.
- *Norton Basin/Edgemere Stewardship Group*: Conducts clean-ups of the wetland area at the edge of Norton Basin; maintains the small strip of land running along the South Shore of Norton Basin.
- *Salt Marsh Alliance*: Provides support for the Salt Marsh Nature Center in the form of volunteer labor (building maintenance, trail patrol, litter and graffiti clean-up, and repairs) and provision of supplies and equipment.
- *VolunteerNYC.org*: Committed to opportunities in the New York City region for volunteering.

New York Restoration Project: Partners with individuals, community-based groups, and public agencies to reclaim, restore, and develop under-resourced parks, community gardens, and open space in New York City, primarily in economically disadvantaged neighborhoods.

CATEGORY 5: PUBLIC USE AND ENJOYMENT

Chapter 7, Category 5, Public Use and Enjoyment, proposes a number of initiatives to address public access. In this chapter, other implementation strategies are suggested for future consideration. These strategies could be implemented over time pending the availability of additional funding and other resources.



Potential Management Strategy 6a1: Provide access and connections to the waterfront for neighborhoods most in need, based on consideration of current lack of access, population density, and physical barriers.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Ferry Services to the Rockaways

As discussed above, access by train to the Rockaways is logistically difficult and time-consuming. The NPS has proposed a connection, via ferry service, between NPS sites along the Rockaways, other local NPS sites, and Manhattan. Currently in planning and design. The NPS has developed the former Coast Guard station at the foot of the Gil Hodges Memorial Bridge into a temporary ferry landing. Plans for a permanent dock are being finalized.

Idlewild Park/Thurston Basin Boat Access

The EQA recently implemented a waterfront access project including a boat launch at Idlewild Park. However, as currently implemented, this access point does not provide a connection for local residents of eastern Queens to Jamaica Bay via Thurston Basin. Feasibility of extending this access to Jamaica Bay should be explored.

Brochure Development

A brochure showing the current and potential future amenities and programs along the Bay could be developed through a multiple agency partnership and distributed to the public. The brochure will ensure that residents are aware of the location of recreational facilities adjacent to Jamaica Bay. This brochure could be part of series of informational brochures developed to raise awareness among watershed residents about Jamaica Bay and how to best protect its natural resources. A prototype for the first in a potential series of brochures has been developed as part the Jamaica Bay Watershed Protection Plan development process; see Management Strategy 4a2 for more information.

Mapping

Continue to develop comprehensive mapping and documentation of existing recreational amenities and public access points to Jamaica Bay that account for the current programs discussed above to ensure information about proposed or planned access points is integrated. Significant natural landscapes would be identified and the potential to provide connectivity to the bay would be evaluated. This implementation strategy should be combined with other open space mapping efforts including those related to the Mayor's PLANYC initiatives.



Potential Management Strategy 6b2: Brand the Jamaica Bay Watershed as a recognizable concept along with a process for disseminating related messages.

IMPLEMENTATION STRATEGIES FOR FUTURE CONSIDERATION

Develop Jamaica Bay Branding Strategy and Signage

Raising public awareness of sometimes intangible concepts like water quality, the effects of citizens' and businesses' behaviors within a watershed, and even conveying the idea of a watershed is an extremely difficult task. The abstract nature of these concepts and relationships to complex biophysical processes is challenging for scientists, let alone citizens or laypeople - however concerned they might be. One of the most effective ways to improve public awareness and structure public understanding is to "brand" the Jamaica Bay Watershed as an "imageable" concept and create a tangible construct for citizens and public officials. The success of branding efforts surrounding locales as varied as Curitiba, Brazil, the "Ecological City," and the Chesapeake Bay Foundation's "Save the Bay" campaign demonstrate how effective making a watershed "imageable" can be. These regions have had simple, palatable messages, compelling graphics, media materials, and a supportive public education campaign that have fostered long term public environmental sustainability efforts, involving a spectrum of stakeholders from business owners to residents and government officials to school children. Jamaica Bay could greatly benefit from a similar branding campaign. Branding nomenclature, slogan(s), and graphics could identify landscapes and projects, denote initiatives, and adorn various marketing materials associated with Jamaica Bay watershed events.

The initial project activity is to identify potential funding opportunities and develop a strategy for program implementation. Implementation strategies will be focused on the design of a brand for Jamaica Bay, identifying appropriate locations for sign installation through interagency discussions and funding to cover design, installation and maintenance costs for signs, and for the development of other mediums for disseminating Jamaica Bay-related messages.

NYCDEP will coordinate with NYCDOT in terms of sign locations, dimensions, and costs. The NYCDOT requires Standard Highway E Modified (thickest) Font (for highway signs) or 5" Highway C Font (for local street signs) and requests text and sign dimensions be kept to a minimum. Highway signs will be located at the beginning of the watershed area in each direction of the highway. The NYCDEP will submit a plan to NYCDOT that includes text and other information to be included on each sign, locations of signs, maintenance plans, and number of signs to be installed. Plans for signs to be installed on Expressways and Parkways must also be submitted to the NYS DOT for their



approval. The branding design could also be used in informational brochures targeted toward residents of Jamaica Bay as well as interpretative exhibits in parks throughout the watershed.

“Brand” development would be initiated by reviewing the environmentally focused branding programs from other regions and the determination of applicability to the Jamaica Bay watershed. Next, the development of a community website, slogan, logo prototype, and other promotional materials to “brand” and publicize information about the Jamaica Bay watershed will be evaluated. A design competition among school children could be initiated to help design the “logo.” Finally, NYCDEP will coordinate with multiple agencies including NYCDOT and NYCDPR to discuss roadway signs, signage requirements and sign installation. Signs could include the Jamaica Bay watershed brand as well as additional interpretive information to convey the interconnections between different parts of the watershed. These signs would be located along roadways that intersect the watershed boundary, within parks, schools, and other natural landscapes throughout the watershed.

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